

Amendment

Please cancel claims 28-54 without prejudice.

Please add new claims 55-81.

Claims 1-27 (previously cancelled).

Claims 28-54 (cancelled herein).

Claims 55-78 are found below.

B¹ Claim 55 (newly added). A semiconductor light source for emitting light to illuminate a space used by humans, the semiconductor light source comprising:

an enclosure, said enclosure being fabricated from a material substantially transparent to white light,

a base to which said enclosure is mounted,

an interior volume within said enclosure,

a secondary heat sink located in said interior volume, said secondary heat sink being capable of drawing heat from one or more semiconductor devices,

a plurality of primary heat sinks mounted on said secondary heat sink, each of said primary heat sinks being smaller than said secondary heat sink,

a semiconductor chip capable of emitting light mounted on one of said primary heat sinks, said semiconductor chip being capable of emitting monochromatic light, said semiconductor chip being selected from the group consisting of light emitting diodes, light emitting diode arrays, laser chips, and VCSEL chips,

said chip including a substrate on which epitaxial layers are grown,

a buffer layer located on said substrate, said buffer layer serving to mitigate differences in material properties between said substrate and other epitaxial layers,

a first cladding layer serving to confine electron movement within the chip, said first cladding layer being adjacent said buffer layer,

an active layer, said active layer emitting light when electrons jump to a valance state,

a second cladding layer, said second cladding layer positioned so that said active layer lies between cladding layers,

a first and a second reflective layer, each of said first and second reflective layers being located on opposite sides of said active layer, said reflective layers serving to reflect light emitted by said active layer, said reflective layers including multiple quantum wells,
a contact layer on which an electron may be mounted for powering said chip, and
a coating for converting monochromatic light emitted by said chip to white light.

Claim 56 (newly added). A device as recited in claim 55 wherein said substrate is selected from the group consisting of Si, GaAs, GaN, InP, sapphire, SiC, GaSb, InAs.

Claim 57 (newly added). A device as recited in claim 55 wherein said substrate is electrically conductive.

Claim 58 (newly added). A device as recited in claim 55 wherein said substrate is electrically insulative.

Claim 59 (newly added). A device as recited in claim 55 wherein at least one of said epitaxial layers includes a material selected from the group consisting of GaN, AlGaIn, AlN, AlGaIn, GaInN, and GaInN.

Claim 60 (newly added). A device as recited in claim 55 further comprising a phosphor coating on said chip.

Claim 61 (newly added). A device as recited in claim 55 further comprising a power module for powering the light source, said power module including a fitting for installation in a traditional light bulb socket and an AC/DC converter for converting AC power from traditional building wiring to DC power usable by a semiconductor devices.

Claim 62 (newly added). A device as recited in claim 55 wherein at least one of said heat sink includes a material selected from the group consisting of include copper, aluminum, silicon carbide, boron nitride natural diamond, monocrystalline diamond, polycrystalline diamond, polycrystalline diamond compacts, diamond deposited through chemical vapor deposition and diamond deposited through physical vapor deposition.

Claim 63 (newly added). A device as recited in claim 55 further comprising a quantity of heat conductive adhesive located between said chip and said primary heat sink and serving to conduct heat from said chip to said primary heat sink.

Claim 64 (newly added). A device as recited in claim 55 further comprising a quantity of light reflective adhesive located between said chip and said primary heat sink.

Claim 65 (newly added). A device as recited in claim 55 wherein at least one of said reflective layers includes multiple quantum wells.

Claim 66 (newly added). A semiconductor light source for emitting light to illuminate a space used by humans, the semiconductor light source comprising:

an enclosure, said enclosure being fabricated from a material substantially transparent to white light,

a base to which said enclosure is mounted,

an interior volume within said enclosure,

a secondary heat sink located in said interior volume, said secondary heat sink being capable of drawing heat from one or more semiconductor devices,

a plurality of primary heat sinks mounted on said secondary heat sink, each of said primary heat sinks being smaller than said secondary heat sink,

a plurality of wells, said wells being located on said primary heat sinks and being sized to accommodate mounting of a semiconductor chip therein,

a semiconductor chip capable of emitting light mounted in one of said primary heat sink wells, said semiconductor chip being capable of emitting monochromatic light,

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a quantity of adhesive serving to secure said chip to said primary heat sink,
said chip including a substrate on which epitaxial layers are grown,
a buffer layer located on said substrate, said buffer layer serving to mitigate differences in material properties between said substrate and other epitaxial layers,
a first cladding layer serving to confine electron movement within the chip, said first cladding layer being adjacent said buffer layer,
an active layer, said active layer emitting light when electrons jump to a valance state,
a second cladding layer, said second cladding layer positioned so that said active layer lies between cladding layers, and
a contact layer,
a first and a second reflective layer, each of said first and second reflective layers being located on opposite sides of said active layer, said reflective layers serving to reflect light emitted by said active layer, said reflective layers including multiple quantum wells, and
a coating for converting monochromatic light emitted by said chip to white light.

Claim 67 (newly added). A device as recited in claim 66 wherein said substrate is selected from the group consisting of Si, GaAs, GaN, InP, sapphire, SiC, GaSb, InAs.

Claim 68 (newly added). A device as recited in claim 66 wherein said substrate is electrically conductive.

Claim 69 (newly added). A device as recited in claim 66 wherein said substrate is electrically insulative.

Claim 70 (newly added). A device as recited in claim 66 wherein at least one of said epitaxial layers includes a material selected from the group consisting of GaN, AlGaIn, AlN, AlGaIn, GaInN, and GaInN.

Claim 71 (newly added). A device as recited in claim 66 further comprising a phosphor coating on said chip.

Claim 72 (newly added). A device as recited in claim 66 further comprising a power module for powering the light source, said power module including a fitting for installation in a traditional light bulb socket and an AC/DC converter for converting AC power from traditional building wiring to DC power usable by a semiconductor devices.

Claim 73 (newly added). A device as recited in claim 66 wherein at least one of said heat sink includes a material selected from the group consisting of include copper, aluminum, silicon carbide, boron nitride natural diamond, monocrystalline diamond, polycrystalline diamond, polycrystalline diamond compacts, diamond deposited through chemical vapor deposition and diamond deposited through physical vapor deposition.

Claim 74 (newly added). A device as recited in claim 66 further comprising a quantity of heat conductive adhesive located between said chip and said primary heat sink and serving to conduct heat from said chip to said primary heat sink.

Claim 75 (newly added). A device as recited in claim 66 further comprising a quantity of light reflective adhesive located between said chip and said primary heat sink.

Claim 76 (newly added). A device as recited in claim 66 further comprising a cover over said chip in said well.

Claim 77 (newly added). A device as recited in claim 66 further comprising a coating over said chip in said well.

Claim 78 (newly added). A device as recited in claim 66 further comprising a transparent material located in said well and covering said chip, said transparent material being capable of converting monochromatic light emitted by said chip to white light.

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